DETAILED ACTION

1. This is an Examiners Amendment and Reasons for Allowance of all claims pending after entry of the amendments herein. Claims 1 and 6 are allowed.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Atty John Luce (Reg. No 34,378) on 2/12/2010.

In the Specification

From the "Amendments to the Specification" filed 3/19/2009, in the 2nd paragraph, please amend as follows:

Figure 2 illustrates the effective progression of the path 19 created by the measuring heads 12 if they move at a uniform speed in the direction (x) perpendicular to the conveying direction (z) of the film 8. Since the measuring head 12 moves at a uniform speed, it provides a uniform~~, i.e., time-equidistant,~~ measurement of the film thickness at definite positions in the x-direction in each measuring cycle. For the purpose of determining a complete thickness

profile of the film 8, the measuring heads 12 move up to the borders of the film 8.

In the claims:

Cancel claims 2-5 and 7-11.

Please amend claims 1 and 6 as indicated below:

1. A process for the automatic control of the thickness of an extruded film, comprising:

measuring a thickness value profile of the extruded film with a thickness-measuring probe that is moved at a uniform speed along a surface of the film in a direction (x) that is substantially perpendicular to a conveying direction (z) of the extruded film, the thickness-measuring probe recording for each measuring cycle the thickness value profile of the film at least across parts of an expansion area of the film in the direction (x) perpendicular to the conveying direction (z) by measuring thickness values at definite positions in the x-direction in each measuring cycle ~~equidistant time intervals~~;

transmitting the measured values to a control unit;

storing the measured values in a storage unit;

determining statistical values of the film thickness with a computer~~,~~ ~~the computer accounting for the measured~~

~~values or information derived therefrom~~ using a definite ~~fixed~~ number of ~~the~~ measuring cycles (N) and the stored ~~providing~~ measured values from recent and previous measuring cycles with different weighting factors (k), ~~the measured values obtained during a predetermined time-frame at a start of the extrusion process being more heavily weighted by the computer than the measured values obtained during operation subsequent to the predetermined start time-frame~~;

determining deviations in the statistical values of the film thickness from a target value;

and

generating control commands to a device for controlling the film thickness based at least in part on the deviations;

wherein the number of measuring cycles used during the predetermined time-frame at the start of the extrusion process is smaller than a number of measuring cycles used subsequent to the predetermined start time-frame, and/or wherein at least one weighting factor used during the predetermined time-frame at the start of the extrusion process is larger than the weighting factor used subsequent to the predetermined start time-frame; and

wherein the determining statistical values includes dividing the sum of the weighted measured values by the number of measuring cycles (N) and/or by the sum of the weights (k); and

wherein the number of the measuring cycles (N) and/or at least one weighting factor(s)(k) used during the predetermined start time at the start of the extrusion process is/are traced back in a series of steps within a large number of measuring cycles to a larger number of measuring cycles and/or an at least one smaller weighting factor(s) used in the operation subsequent to the predetermined start time-frame.

6. A device for the automatic control of the thickness of an extruded film, comprising:

a thickness-measuring probe that measures a thickness value profile of the extruded film that is moved at a uniform speed along a surface of the film in a direction (x) that is substantially perpendicular to a conveying direction (z) of the extruded film, the thickness measuring probe recording for each measuring cycle the thickness value profile of the film at least across parts of an expansion area of the film in the direction (x)

perpendicular to the conveying direction (z) by measuring thickness values at definite positions in the x-direction in each measuring cycle ~~equidistant time intervals~~;

a device that transmits the measured values to a control unit;

a storage unit that records the measured values and information derived therefrom;

a computer that determines statistical values of the film thickness ~~by accounting for the measured values or the information derived therefrom~~ using a definite ~~fixed~~ number of ~~the~~ measuring cycles (N) and the recorded ~~providing~~ measured values from recent and previous measuring cycles with different weighting factors (k), ~~the measured values obtained during a predetermined time-frame at a start of the extrusion process being more heavily weighted by the computer than the measured values obtained during a operation subsequent to the predetermined start time-frame~~, and determines deviations in the statistical values of the film thickness from a target value; and

a device that generates control commands to a device that controls the film thickness based at least in part on the deviations;

wherein the number of measuring cycles used during the predetermined time-frame at the start of the extrusion process is smaller than a number of measuring cycles used subsequent to the predetermined start time-frame, and/or wherein at least one weighting factor used during the predetermined time-frame at the start of the extrusion process is larger than the weighting factor used subsequent to the predetermined start time-frame; and

wherein the determining statistical values includes dividing the sum of the weighted measurements by the number of measuring cycles (N) and/or by the sum of the weights (k);

and

wherein the number of the measuring cycles (N) and/or at least one weighting factor(s)(k) used during the predetermined start time at the start of the extrusion process is/are traced back in a series of steps within a large number of measuring cycles to a larger number of measuring cycles and/or an at least one smaller weighting factor(s) used in the operation subsequent to the predetermined start time-frame.

Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance:

The prior art of record does not teach or fairly suggest the method and device for control of the thickness of extruded film as particularly disclosed and claimed by the present invention. Specifically, none of the closest prior art Dahlin (US Pat. No. 3,610,899) or Hirata et al. (US Pat. No. 6,856,855), Akasaka (US Pat. No. 4,994,976), and Higham (US Pat. No. 4,000,402) alone or in combination, teach or fairly suggest the complete method or device as recited and including: *wherein the number of the measuring cycles (N) and/or at least one weighting factor(s)(k) used during the predetermined start time at the start of the extrusion process is/are traced back in a series of steps within a large number of measuring cycles to a larger number of measuring cycles and/or an at least one smaller weighting factor(s) used in the operation subsequent to the predetermined start time-frame* as recited in independent claims 1 and 6 of the present invention, the invention having advantage in more quickly reducing thickness deviations of extruded film after a change in the operational parameters (e.g. thickness) of the extrusion process while avoiding an abrupt change of the control parameters in the transition from the start of the extrusion process to a normal or stable operation.

Dahlin (US Pat. No. 3,610,899) teaches a method and device for controlling thickness of a paper manufacturing system (see Figure 6; *paper* production thickness control being an analogous art with respect to film extrusion), with the purpose of more quickly controlling (reducing) thickness

deviations by taking uniform measurements at definite positions in the transverse direction of the paper (a "film") and applying an exponential weighting factor (see Figs. 3B and 3B) to a fixed number of samples, thereby more heavily weighting the more recently sampled values. However, Dahlin does not expressly teach the changing of either or both of the number of measuring cycles and/or the weighting factors used during the start of the extrusion process to a different number of measuring cycles and/or weighting factors at a time period subsequent to the start of the extrusion process, where the change from one number of measuring cycles to a larger number of measuring cycles, or the change from one weighting factor to the smaller weighting factor(s), is *traced back* (i.e. changed from one number or weight to a different number or weight) in a series of steps within a large number of measuring cycles. Specifically, Dahlin (US Pat. No. 3,610,899) does not teach *wherein the number of measuring cycles used during the predetermined time-frame at the start of the extrusion process is smaller than a number of measuring cycles used subsequent to the predetermined start time-frame, and/or wherein at least one weighting factor used during the predetermined time-frame at the start of the extrusion process is larger than the weighting factor used subsequent to the predetermined start time-frame;* and *wherein the number of the measuring cycles (N) and/or at least one weighting factor(s)(k) used during the predetermined start time at the start of the extrusion process is/are traced back in a series of steps within a large number of measuring cycles to a larger number of measuring cycles and/or an at least one smaller weighting factor(s) used in the operation subsequent to the*

predetermined start time-frame as recited in independent claims 1 and 6 of the present invention.

Hirata et al. (US Pat. No. 6,856,855) teaches a method of controlling sheet thickness in an extrusion process using a thickness control/prediction formula which incorporates interference of adjacent thickness control means (e.g. heat bolt thermal extrusion thickness controls), and includes a suggestion that controls may be "carried out at short cycles…at the beginning of production" and "at long cycles…during stable production" (see Hirata, column 7, lines 9-13). Even so, while Hirata suggests changing the number of measuring cycles at the start of the extrusion process as compared to the number of measuring cycles subsequent, during "stable production," still Hirata et al. does not expressly teach *wherein the number of the measuring cycles (N) and/or at least one weighting factor(s)(k) used during the predetermined start time at the start of the extrusion process is/are <u>traced back in a series of steps within a large number of measuring cycles</u> to a larger number of measuring cycles and/or an at least one smaller weighting factor(s) used in the operation subsequent to the predetermined start time-frame.* Rather, Hirata is silent on the method of transition from the "short cycles" at the start of the extrusion process to the "long cycles" during stable operation subsequent to the start of the extrusion process. Thus, Dahlin in view of Hirata also fails to teach or fairly suggest the entirely of the invention as recited in independent claims 1 and 6 of the present invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

The prior art made of record and listed on the attached PTO Form 892 but not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is (571)272-8220. The examiner can normally be reached on 9 am to 5 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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